CLAIMS:

1. An optical window deposition shield comprising:

a backing plate having a through hole;

a honeycomb structure having a plurality of adjacent cells configured to allow optical viewing through the honeycomb structure, each cell having an aspect ratio of length to diameter sufficient to impede a processing plasma from traveling through the full length of the cell; and

a coupling device configured to couple the honeycomb core structure to the backing plate such that the honeycomb structure is aligned with at least a portion of the through hole in the backing plate.

2. The optical window deposition shield of Claim 1, wherein said backing plate comprises aluminum sheet metal.

3. The optical window deposition shield of Claim 1, wherein said backing plate comprises anodized aluminum sheet metal.

4. The optical window deposition shield of Claim 1, wherein said backing plate is configured to be coupled to a chamber liner such that the through hole is at least partially aligned with a hole in the chamber liner.

5. The optical window deposition shield of Claim 4, wherein said through hole substantially contours the hole in the chamber liner.

6. The optical window deposition shield of Claim 1, wherein said honeycomb structure comprises aluminum.

7. The optical window deposition shield of Claim 6, wherein said honeycomb structure is coated with a protective coating.

8. The optical window deposition shield of Claim 6, wherein said protective coating comprises a compound including an oxide of aluminum.

9. The optical window deposition shield of Claim 6, wherein said protective coating comprises a compound including a mixture of Al_2O_3 and Y_2O_3.

10. The optical window deposition shield of Claim 6, wherein said protective coating comprises a compound including at least one of a III-column element and a lanthanon element.

11. The optical window deposition shield of Claim 10, wherein the III-column element comprises at least one of yttrium, scandium, and lanthanum.

12. The optical window deposition shield of Claim 10, wherein the lanthanon element comprises at least one of cerium, dysprosium, and europium.

13. The optical window deposition shield of Claim 6, wherein said protective coating comprises at least one of yttria (Y_2O_3), Sc_2O_3, Sc_2F_3, YF_3, LA_2O_3, CeO_2, Eu_2O_3, and DyO_3.

14. The optical window deposition shield of Claim 1, wherein said honeycomb structure is configured to fit snugly into a hole in a plasma processing chamber liner to provide a deposition shield within said hole in the chamber liner.

15. The optical window deposition shield of Claim 1, wherein said cells of the honeycomb structure have an aspect ratio of about four or more.

16. The optical window deposition shield of Claim 1, wherein said coupling device comprises a retaining flange that is detachably coupled to the backing plate by press contact when the backing plate is coupled to the chamber liner.

17. The optical window deposition shield of Claim 1, wherein said coupling device comprises at least one retaining pin fixed to the backing plate and configured to engage at least one cell of the honeycomb structure when the honeycomb structure is pressed over the at least one retaining pin.

18. The optical window deposition shield of Claim 17, wherein the at least one retaining pin is configured to engage the at least one cell of the honeycomb structure by deforming the cell.

19. The optical window deposition shield of Claim 1, wherein said coupling device comprises at least one threaded fastener fixed to the backing plate and configured to hold the honeycomb structure in contact with the backing plate.

20. An optical window deposition shield comprising:

a honeycomb structure planar sheet having a plurality of adjacent cells configured to allow optical viewing through the honeycomb structure, each cell having an aspect ratio of length to diameter sufficient to impede a processing plasma from traveling through the full length of the cell; and

a clip device configured to hold opposing ends of the honeycomb planar sheet together to form a substantially continuous liner of honeycomb material configured to line the chamber wall of a plasma processing chamber.

21. A plasma processing chamber comprising:

a chamber wall having an optical viewing window;

a chamber liner having a hole that is substantially aligned with said viewing window to permit viewing an interior of the chamber through the viewing window and hole; and

an optical window deposition shield substantially aligned with said viewing window and liner hole, the optical viewing window deposition shield comprising:

a backing plate having a through hole;

a honeycomb structure having a plurality of adjacent cells configured to allow optical viewing through the honeycomb structure, each cell having an aspect

ratio of length to diameter sufficient to impede a processing plasma from traveling through the full length of the cell; and

a coupling device configured to couple the honeycomb core structure to the backing plate such that the honeycomb structure is aligned with at least a portion of the through hole in the backing plate.

22. The plasma processing chamber of Claim 21, wherein said backing plate comprises aluminum sheet metal.

23. The plasma processing chamber of Claim 21, wherein said backing plate comprises anodized aluminum sheet metal.

24. The plasma processing chamber of Claim 21, wherein said backing plate is configured to be coupled to a chamber liner such that the through hole is at least partially aligned with a hole in the chamber liner.

25. The plasma processing chamber of Claim 24, wherein said through hole substantially contours the hole in the chamber liner.

26. The plasma processing chamber of Claim 21, wherein said honeycomb structure comprises aluminum.

27. The plasma processing chamber of Claim 26, wherein said honeycomb structure is coated with a protective coating.

28. The plasma processing chamber of Claim 26, wherein said protective coating comprises a compound including an oxide of aluminum.

29. The plasma processing chamber of Claim 26, wherein said protective coating comprises a compound including a mixture of Al_2O_3 and Y_2O_3.

30. The plasma processing chamber of Claim 26, wherein said protective coating comprises a compound including at least one of a III-column element and a lanthanon element.

31. The plasma processing chamber of Claim 30, wherein the III-column element comprises at least one of yttrium, scandium, and lanthanum.

32. The plasma processing chamber of Claim 30, wherein the lanthanon element comprises at least one of cerium, dysprosium, and europium.

33. The plasma processing chamber of Claim 26, wherein said protective coating comprises at least one of yttria (Y_2O_3), Sc_2O_3, Sc_2F_3, YF_3, LA_2O_3, CeO_2, Eu_2O_3, and DyO_3.

34. The plasma processing chamber of Claim 21, wherein said honeycomb structure is configured to fit snugly into a hole in a plasma processing chamber liner to provide a deposition shield within said hole in the chamber liner.

35. The plasma processing chamber of Claim 21, wherein said cells of the honeycomb structure have an aspect ratio of about four or more.

36. The plasma processing chamber of Claim 21, wherein said coupling device comprises a retaining flange that is detachably coupled to the backing plate by press contact when the backing plate is coupled to the chamber liner.

37. The plasma processing chamber of Claim 21, wherein said coupling device comprises at least one retaining pin fixed to the backing plate and configured to engage at least one cell of the honeycomb structure when the honeycomb structure is pressed over the at least one retaining pin.

38. The plasma processing chamber of Claim 37, wherein the at least one retaining pin is configured to engage the at least one cell of the honeycomb structure by deforming the cell.

39. The plasma processing chamber of Claim 21, wherein said coupling device comprises at least one threaded fastener fixed to the backing plate and configured to hold the honeycomb structure in contact with the backing plate.

40. An optical window deposition shield comprising:

means for impeding processing plasma from traveling into contact with a viewing window of a plasma chamber; and

means for holding the means for impeding within an opening of a chamber liner used in the plasma chamber.

41. A method for impeding a processing plasma from traveling into contact with a viewing window of a plasma chamber, the method comprising;

providing a mounting hole in a liner of the plasma chamber; and

fixedly mounting a honeycomb structure within the mounting hole, said honeycomb structure having a plurality of adjacent cells configured to allow optical viewing through the honeycomb structure, each cell having an aspect ratio of length to diameter sufficient to impede a processing plasma from traveling through the full length of the cell.